

meet the stipulated health, physical, and academic requirements. (For information about merchant marine occupations, see the statement on water transportation occupations elsewhere in the *Handbook*.)

Fishers must be in good health and possess physical strength. Good coordination and mechanical aptitude are necessary to operate, maintain, and repair equipment and fishing gear. Fishers need perseverance to work long hours at sea, often under difficult conditions. On large vessels, they must be able to work as members of a team. Fishers must be patient, yet always alert, to overcome the boredom of long watches, when not engaged in fishing operations. The ability to assume any deckhand's functions, on short notice, is important. As supervisors, mates must be able to assume all duties, including the captain's, when necessary. The captain must be highly experienced, mature, decisive, and possess the business skills needed to run business operations.

On fishing vessels, most fishers begin as deckhands. Deckhands whose experience and interests are in ship engineering—maintenance and repair of ship engines and equipment—can eventually become licensed chief engineers on large commercial vessels, after meeting the Coast Guard's experience, physical, and academic requirements. Divers in fishing operations can enter commercial diving activity—for example, repairing ships or maintaining piers and marinas—usually after completion of a certified training program sponsored by an educational institution or industry association. Experienced, reliable deckhands who display supervisory qualities may become boatswains. Boatswains may, in turn, become second mates, first mates, and finally captains. Almost all captains become self-employed, and the overwhelming majority eventually own, or have an interest in, one or more fishing ships. Some may choose to run a sport or recreational fishing operation. When their seagoing days are over, experienced individuals may work in or, with the necessary capital, own stores selling fishing and marine equipment and supplies. Some captains may assume advisory or administrative positions in industry trade associations or government offices, such as harbor development commissions or in teaching positions in industry-sponsored workshops or educational institutions.

### Job Outlook

Employment of fishers and fishing vessel operators is expected to decline through the year 2008. These occupations depend on the natural ability of fish stock to replenish itself through growth and reproduction, as well as on governmental estimates of the health of fisheries. Many operations are currently at or beyond maximum sustainable yield, and the number of workers who can earn an adequate income from fishing is expected to decline. Job openings will arise from the need to replace workers who retire or leave the occupation. Some fishers and fishing vessel operators leave the occupation, because of the strenuous and hazardous nature of the job and the lack of steady, year-round income.

In many areas, particularly the North Atlantic, pollution and excessive fishing have adversely affected the stock of fish and, consequently, the employment opportunities for fishers. In some areas, States have greatly reduced permits to fishers, to allow stocks of fish and shellfish to replenish themselves, idling many fishers. Other factors contributing to the projected

decline in employment of fishers include the use of sophisticated electronic equipment for navigation, communication, and fish location; improvements in fishing gear, which have greatly increased the efficiency of fishing operations; and the use of highly automated *floating processors*, where the catch is processed aboard the vessel. Sport fishing boats will continue to provide some job opportunities.

### Earnings

Median weekly earnings of full-time fishers and fishing vessel operators were about \$386 in 1998. The middle 50 percent earned between \$292 and \$641. The highest paid 10 percent earned over \$785, whereas the lowest paid 10 percent earned less than \$194.

Earnings of fishers and fishing vessel operators normally are highest in the summer and fall—when demand for services peaks and environmental conditions are favorable—and lowest during the winter. Many full-time and most part-time workers supplement their income by working in other activities during the off-season. For example, fishers may work in seafood processing plants, establishments selling fishing and marine equipment, or in construction.

Earnings of fishers vary widely, depending upon the specific occupational function, size of the ship, and the amount and value of the catch. The costs of the fishing operation—operating the ship, repair and maintenance of gear and equipment, and the crew's supplies—are deducted from the sale of the catch. Net proceeds are distributed among the crew members in accordance with a prearranged percentage. Generally, the ship's owner—usually its captain—receives half of the net proceeds, which covers any profit as well as the depreciation, maintenance, and replacement costs of the ship.

### Related Occupations

Numerous occupations involve outdoor activities similar to those of fishers and fishing vessel operators. Among these are fishing and hunting guides, fish hatchery and aquaculture workers, game wardens, harbor pilots, merchant marine officers and seamen, and wildlife management specialists.

### Sources of Additional Information

For information on licensing requirements to fish in a particular area, contact:

☛ National Marine Fisheries Service, NMFS Scientific Publications Office, 7600 Sand Point Way NE., Seattle, WA 98115.

Names of postsecondary schools offering fishing and related marine educational programs are available from:

☛ Marine Technology Society, 1828 L St. NW., Suite 906, Washington, DC 20036-5104.

Information on licensing of fishing vessel captains and mates, and requirements for merchant mariner documentation, is available from the U.S. Coast Guard Marine Inspection Office or Marine Safety Office in your State, or:

☛ Office of Compliance, Commandant (G-MOC-3) 2100 Second St. SW., Washington, DC 20593.

☛ Licensing and Pilotage Branch, National Maritime Center, 4200 Wilson Blvd., Suite 510, Arlington, VA 22203-1804.

## Food Processing Occupations

### Butchers and Meat, Poultry, and Fish Cutters

(O\*NET 65023, 89802, and 93938)

#### Significant Points

- Workers in meatpacking plants have among the highest incidences of injury and illness of all workers.

- Length of training ranges from a few days for some cutters to 1 or 2 years for highly skilled butchers.
- Job growth will be concentrated among lower skilled meat, poultry, and fish cutters, as more meat cutting and processing shifts from retail stores to food processing plants.

#### Nature of the Work

Butchers and meat, poultry, and fish cutters are employed at different stages in the process that converts animal carcasses into manageable

pieces of meat suitable for sale to wholesales or consumers. Meat, poultry, and fish cutters commonly work in meatpacking or fish and poultry processing plants, while butchers are usually employed at the retail level. As a result of this distinction, the nature of these jobs varies significantly.

In meatpacking plants, *meatcutters* slaughter cattle, hogs, goats, and sheep and cut the carcasses into large wholesale cuts, such as rounds, loins, ribs, and chucks to facilitate the handling, distribution, and marketing of meat. In some of these plants, meatcutters also further process these primal parts into cuts that are ready for retail use. These workers also produce hamburger meat and meat trimmings, which are used to prepare sausages, luncheon meats, and other fabricated meat products. Meatcutters usually work on assembly lines, with each individual responsible for only a few of the many cuts needed to process a carcass. Depending on the type of cut, they use knives, cleavers, meat saws, bandsaws, or other, often dangerous, equipment.

In grocery stores, wholesale establishments that supply meat to restaurants, and institutional food service facilities, *butchers* separate wholesale cuts of meat into retail cuts or individual size servings. They cut meat into steaks and chops, shape and tie roasts, and grind beef for sale as chopped meat. Boneless cuts are prepared using knives, slicers, or power cutters, while bandsaws are required to carve bone-in pieces. Butchers in retail food stores may also weigh, wrap, and label the cuts of meat, arrange them in refrigerated cases for display, and prepare special cuts of meat to fill unique orders.

*Poultry cutters* slaughter and cut up chickens, turkeys, and other types of poultry. Although the poultry processing industry is becoming

increasingly automated, many jobs such as trimming, packing, and deboning are still done manually. As in the meatpacking industry, most poultry cutters perform routine cuts on poultry as it moves along production lines.

Unlike the occupations listed above, *fish cutters*, also called *fish cleaners*, are likely to be employed in both manufacturing and retail establishments. These workers primarily cut, scale, and dress fish by removing the head, scales, and other inedible portions and cutting the fish into steaks or boneless fillets. In retail markets, they may also wait on customers and clean fish to order.

Meat, poultry, and fish cutters also prepare ready-to-heat foods. This often entails filleting meat or fish or cutting it into bite-sized pieces, preparing and adding vegetables, or applying sauces or breading.

### Working Conditions

Working conditions vary by type and size of establishment. In meatpacking plants and large retail food establishments, butchers and meatcutters work in large meatcutting rooms equipped with power machines and conveyors. In small retail markets, the butcher or fish cleaner may work in a space behind the meat counter. To avoid viral and bacterial infections, work areas must be clean and sanitary.

Butchers and meat, poultry, and fish cutters often work in cold, damp rooms, which are refrigerated to prevent meat from spoiling and are damp because meat cutting generates large amounts of blood, condensation, and fat. Cool damp floors increase the likelihood of slips and falls. In addition, the low temperature, combined with the need to stand for long periods of time and perform physical tasks, makes the work tiring. As a result, butchers and meat, poultry, and fish cutters are more susceptible to injury than most other workers. In fact, meatpacking plants had the highest incidence of work-related injury and illness of any industry in 1997. Nearly 1 in 3 employees experienced a work-related injury or illness during that year.

Injuries include cuts, and even amputations, that occur when knives, cleavers, and power tools are used improperly. Also, repetitive slicing and lifting often lead to cumulative trauma injuries, such as carpal tunnel syndrome. To reduce the incidence of cumulative trauma disorders, some employers have reduced workloads, redesigned jobs and tools, and increased awareness of early warning signs. Nevertheless, workers in this occupation still face the serious threat of disabling injuries.

### Employment

Butchers and meat, poultry, and fish cutters held about 359,000 jobs in 1998. Nearly 60 percent worked in meatpacking or poultry and fish processing plants, while most others in this occupation were employed at the retail level in grocery stores, meat and fish markets, restaurants, or hotels. The majority of the 216,000 skilled butchers and meatcutters worked in retail grocery stores, while nearly all meat, poultry, and fish cutters worked in meatpacking or poultry and fish processing plants.

Highly skilled butchers and meatcutters are employed in almost every city and town in the Nation, while lower skilled meat, poultry, and fish cutter jobs are concentrated in communities with food processing plants.

### Training, Other Qualifications, and Advancement

Most butchers and meat, poultry, and fish cutters acquire their skills on the job through formal and informal training programs. The length of training varies significantly in this occupation, with simple cutting operations requiring a few days to learn, while more complex tasks, like eviscerating, generally require about a month to learn. The training period for a highly skilled butcher at the retail level may be a 1 or 2 years.

Generally, on-the-job trainees begin by doing less difficult jobs, such as simple cuts or removing bones. Under the guidance of experienced workers, trainees learn the proper use of tools and equipment and how to prepare various cuts of meat. After demonstrating skill with various meatcutting tools, they learn to divide carcasses into wholesale cuts and wholesale cuts into retail and individual portions. Trainees may also learn to roll and tie roasts, prepare sausage, and cure meat.



Butchers separate wholesale cuts of meat into retail cuts or individual-size servings.

Those employed in retail food establishments often are taught operations such as inventory control, meat buying, and record keeping. In addition, growing concern about the safety of meats has led employers to offer extensive training in food safety to employees.

Skills important in meat, poultry, and fish cutting are manual dexterity, good depth perception, color discrimination, and good hand-eye coordination. Physical strength is often needed to lift and move heavy pieces of meat. Butchers and fish cleaners who wait on customers should have a pleasant personality, a neat appearance, and the ability to communicate clearly. In some States, a health certificate is required for employment.

Butchers and meat, poultry, and fish cutters in retail or wholesale establishments may progress to supervisory jobs, such as meat or seafood department managers in supermarkets. A few of these workers become meat or seafood buyers for wholesalers or supermarket chains. Some open their own meat or fish markets. In processing plants, meat, poultry, and fish cutters may advance to supervisory positions or become team leaders.

Job Outlook

Overall employment of butchers and meat, poultry, and fish cutters is expected to grow more slowly than the average for all occupations through 2008. Job growth will be concentrated among lower skilled meat, poultry, and fish cutters, as more meat cutting and processing shifts from retail stores to food processing plants. Nevertheless, job opportunities should be available at all levels of the occupation due to the need to replace experienced workers who transfer to other occupations or leave the labor force.

As the Nation’s population grows, the demand for meat, poultry, and seafood should continue to increase. Successful marketing by the poultry industry is likely to increase demand for rotisserie chicken and ready-to-heat products. Similarly, the development of lower-fat and ready-to-heat products promises to stimulate the consumption of red meat. Although per capita consumption of fish and other seafood has been constant over the previous decade, population growth is expected to push consumption to record levels in coming years.

Employment growth of lower skilled meat, poultry, and fish cutters—who work primarily in meatpacking, poultry, and fish processing plants—is expected to increase faster than the average for all occupations in coming years. Although much of the production of poultry and fabricated poultry products is performed by machines, the growing popularity of labor-intensive, ready-to-heat goods promises to spur demand for poultry workers. Meat and fish cutters also will be in demand, as the task of preparing ready-to-heat meat and fish goods slowly shifts from retail stores to processing plants. Although the supply of edible ocean fish is limited, advances in fish farming, or “aquaculture,” should help meet the growing demand for fish and produce ample opportunities for fish cutters.

Employment of more highly skilled butchers and meatcutters, who work primarily in retail stores, is expected to gradually decline. New automation and the consolidation of the meatpacking and poultry processing industries

are enabling employers to transfer employment from higher-paid butchers to lower-wage meatcutters in meatpacking plants. At present, most red meat arrives at grocery stores partially cut up, but a growing share of meat is being delivered pre-packaged, with additional fat removed, to wholesalers and retailers. This trend is resulting in less work for retail butchers and a declining demand for their employment.

Earnings

Butchers and meatcutters had median annual earnings \$20,420 in 1998. The middle 50 percent earned between \$16,380 and \$26,400. The highest paid 10 percent earned more than \$34,460 annually, while the lowest 10 percent earned less than \$13,140. Butchers and slaughterers who worked at the manufacturing level in the meat products industry earned \$18,100 in 1997. Butchers and meatcutters employed at the retail level typically earn more than those in manufacturing. Median hourly earnings in the retail industries employing the largest number of butchers and meatcutters in 1997 were:

Grocery stores .....	\$22,700
Meat and fish markets .....	19,300
Groceries and related products (wholesale trade) .....	19,200
Eating and drinking places .....	15,000

Meat, poultry, and fish cutters typically earn less than butchers and meatcutters. In 1998, average annual earnings for these lower-skilled workers were \$16,270, with the middle 50 percent earning between \$14,280 and \$18,390, the top 10 percent earning over \$20,760, and the lowest decile less than \$12,780. Meat, poultry, and fish cutters in the meat products industry earned \$15,600 in 1997, while those working in miscellaneous food and kindred products earned \$12,200.

Butchers and meat and fish cutters generally received typical benefits, including pension plans for those who were union members or employed by grocery stores. However, poultry workers rarely earned substantial benefits. Many butchers and meat, poultry, and fish cutters are members of the United Food and Commercial Workers International Union. In 1998, nearly a third of all butchers and meatcutters were union members or covered by a union contract.

Related Occupations

Butchers and meat, poultry, and fish cutters must be skilled at both hand and machine work and must have some knowledge of processes and techniques involved in handling and preparing food. Other occupations in food preparation that require similar skills and knowledge include bakers, chefs and cooks, and food preparation workers.

Sources of Additional Information

Information about work opportunities can be obtained from local employers or local offices of the State employment service. For information on training and other aspects of this trade, contact:

☛ United Food and Commercial Workers International Union, 1775 K St. NW., Washington, DC 20006.

Forestry, Conservation, and Logging Occupations

(O\*NET 73002, 73005, 73011, 73099A, 73099B, 73099C, 73099D, 73099E, 79002A, 79002B, and 79008)

Significant Points

- Workers spend all their time outdoors, sometimes in poor weather and often in isolated areas.
- These jobs are physically demanding and hazardous.
- A small decline is expected in overall employment of forestry and logging occupations.

Nature of the Work

The Nation’s forests are a rich natural resource, providing beauty and tranquillity, varied recreational areas, and wood for commercial use. Managing forests and woodlands requires many different kinds of workers. Forest and conservation workers help develop, maintain, and protect these forests by growing and planting new tree seedlings, fighting insects and diseases that attack trees, and helping to control soil erosion. Timber cutting and logging workers harvest thousands of acres of forests each year for the timber that provides the raw material for countless consumer and industrial products.

Generally working under the direction of a professional forester, *forestry technicians* compile data on the size, content, and condition of